

REMARKS

Claims 8-26 have been amended. Claims 8-26 remain for further consideration. No new matter has been added.

The objections and rejections shall be taken up in the order presented in the Official Action.

1. The drawings currently stand objected to. Specifically, the “feedback” feature of claims 8, 17, 25 and 26 is allegedly not shown in the drawings.

FIG. 1 has been amended to show the signal at the output 30 of the second amplifier stage 3 being connected back to the inverting input 20 of the first amplifier stage 2. Support for this amendment is in the specification as filed on page 4, line 21 to page 5, line 2. This feedback signal can occur of course on-chip or off-chip.

2. Claim 19 currently stands rejected for allegedly being indefinite.

Claim 19 has been amended to correct the alleged indefinite language.

- 3(a). Claims 15, 19, 23 and 24 currently stand rejected for allegedly being anticipated by U.S. Patent 5,745,002 to Baschiroto (hereinafter “Baschiroto”).

Claim 15

Claim 15 recites a two-stage amplifier that provides a two-stage amplifier output signal. The amplifier includes, inter alia:

“a charge pump that generates a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant; and

a voltage source that provides a reference voltage to the charge pump, where the charge pump includes means for generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal." (cl. 1, emphasis added).

The Official Action contends that "*Baschirotto et al. (Figs. 1-3) discloses an amplifier circuit comprising: a first amplifier (A1); a second amplifier (A2); a coupling capacitor (C1) coupled between output of the first amplifier (A1) and input of the second amplifier (A2) in series; switches (S2, S3, S5, S6) and capacitor (Cdc) together are functional equivalent of a charge pump; and reference voltage (Vref) coupled to the charge pump, wherein switches (S2, S3) can be read as claimed means having the function thereof.*" (Official Action, pg. 4).

Upon a fair and proper reading, Baschirotto fails to disclose or suggest the features of claim 15 emphasized above; specifically, of "*a charge pump that generates a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant,*" and the charge pump including means for "*generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.*" Specifically, FIGs. 1 and 2 of Baschirotto fail to disclose or suggest any type of charge pump, let alone a specific type of charge pump that "*generates a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant,*" or a charge pump that includes means for "*generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.*" The disclosure in the text of Baschirotto that corresponds to FIGs. 1 and 2 is in column 2, line 13 through column 3, line 9. There, the circuit of FIG. 1 is described as "*a classical SC integrator.*" (Column 2, line 13). Further, "*[s]witches S2, S3 and S4 are always connected to a fixed voltage (Vref or the virtual ground voltage).*" The circuit of FIG. 2 is characterized as being identical to that of FIG. 1, with

the exception that the switch S1 of FIG. 1 is replaced by an operational amplifier (“op-amp”). (Column 2, lines 46-49). Therefore, from this disclosure and FIGs. 1 and 2, it can be readily seen that the fixed voltage Vref is applied to the capacitor C1 through the switches S2 and S3. This is clearly not a “charge pump” configuration or its equivalent. Instead, this is merely a disclosure of a voltage, Vref, being selectively applied by the switches S2 and S3 to the capacitor C1. In fact, there is no disclosure or suggestion anywhere in the text of column 2, line 13 through column 3, line 9 that describes the circuits of FIGs. 1 and 2 as being or including any type of “charge pump.” In addition, there is no disclosure in FIGs. 1 and 2 or the corresponding text in column 2, line 13 through column 3, line 9 of “*a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant,*” or “*means for generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.*” (cl. 15). Indeed this portion of Baschiroto is completely devoid of any disclosure or suggestion, express or implied, of these claimed features.

With respect to FIG. 3 of Baschiroto, the text in Baschiroto that corresponds to the circuit of FIG. 3 is in column 3, line 10 through column 7, line 12. The additional capacitor Cdc is described there as being “*suitable to inject electrical charge on the output node N2 of the switched capacitance at every switching.*” (Column 3, lines 13-15). The text of Baschiroto goes on to describe how the capacitors C1 and C2 of the circuit of FIG. 3 are alternatively charged and discharged as part of a switched capacitance circuit, where the corresponding voltages on the nodes N1 and N2, (i.e., the voltage across the capacitor C1) are varied accordingly. (See column 3, lines 25-46). This disclosure in Baschiroto is very different from the features of claim 15 of “*a charge pump that generates a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant,*” and the charge

pump including means for “*generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.*” That is, the circuit of FIG. 3 of Baschiroto teaches the use of time-varying voltages at the nodes N1 and N2 and, thus, across the capacitor C1. The circuit of FIG. 3 of Baschiroto is simply a switched capacitance circuit that is intended to be an improvement on such circuits of FIGs. 1 and 2 of Baschiroto, discussed above (See column 3, lines 1-12). As such, the disclosed feature of the time varying voltages at the nodes of the capacitor C1 is in stark contrast to the features of claim 15 of maintaining the time average of the voltage across the coupling capacitor constant, and maintaining a fixed ratio between the reference voltage and the first amplifier circuit. As a result, Baschiroto fails to anticipate these features of claim 15 of “*a charge pump that generates a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant,*” and the charge pump including means for “*generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.*”

In light of the foregoing, it is respectfully submitted that the anticipation rejection of claim 15 in view of Baschiroto is moot and should be removed, and that claim 15 is in condition for allowance and should be passed to issuance.

Claim 19

As independent claim 19 currently stands rejected in the Official Action for the identical reasons as claim 15, the arguments presented hereinabove with respect to the patentability of claim 15 are applicable to claim 19.

3(b). Claims 15, 19, 23 and 24 currently stand rejected for allegedly being anticipated by U.S. Patent 6,529,316 to Nagaraj (hereinafter “Nagaraj”).

Claim 15

Claim 15 recites a two-stage amplifier that provides a two-stage amplifier output signal.

The amplifier includes, inter alia:

“a charge pump that generates a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant; and
a voltage source that provides a reference voltage to the charge pump,
where the charge pump includes means for generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.” (cl. 1, emphasis added).

The Official Action contends that “Nagaraj (Figs. 4, 5) discloses an amplifier circuit comprising: a first amplifier (M1, M2); a second amplifier (M7); a coupling capacitor (C1) coupled between output of the first amplifier (M1, M2) and input of the second amplifier (M7) in series; switches (AZ) and transistors (M11, M12) together are functional equivalent of a charge pump; and reference voltage (ground couple to transistor M11) coupled to the charge pump, wherein switches (AZ) can be read as claimed means having the function thereof.” (Official Action, pg. 4).

Upon a fair and proper reading, Nagaraj fails to disclose or suggest the features of claim 15 emphasized above; specifically, of the charge pump that generates a bias voltage applied to the coupling capacitor “to maintain the time average of the voltage across the coupling capacitor constant,” and the charge pump including means for “generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.” Instead, Nagaraj discloses, in FIGs. 4 and 5 and the corresponding text in column 3, lines 1-44, two ways of

charging capacitor C1 to an appropriate value, where both of these methods for charging the capacitor C1 are very different from the claimed features.

With respect to FIG. 4, Nagaraj discloses that the capacitor C1 is charged to the correct voltage by directly applying the voltages Vb1 and Vb2 during the time the signal AZ is high. *“Once charged, the capacitor C1 simply acts as a battery over the next several clock cycles before it is refreshed again by the occurrence of another pulse on input AZ which again temporarily closes switches AZ to recharge capacitor C1.”* (Col. 3, lines 17-20). Thus, this disclosure in Nagaraj fails to disclose the claimed feature of maintaining the time average of the voltage across the coupling capacitor constant. In fact, this disclosure teaches just the opposite; that is, that the voltage across the capacitor C1 varies (i.e., is reduced by the typical and inherent discharging process when the capacitor acts as a battery), and the capacitor C1 needs to be periodically refreshed to a certain voltage value by a recharging process. As a result, Nagaraj fails to anticipate the claimed feature of *“a charge pump that generates a bias voltage that is applied to the coupling capacitor to maintain the time average of the voltage across the coupling capacitor constant.”*

Also, with respect to both FIGs. 4 and 5, Nagaraj contains no disclosure or suggestion, express or implied, that the bias voltage applied to the capacitor C1 maintains a fixed ratio between the reference voltage (“ground” as contended in the Official Action) and the first amplifier input signal. Indeed, Nagaraj makes no connection whatsoever in its disclosure between such ground reference voltage and the first amplifier input signal. What’s more, because Nagaraj, in FIG. 4, fails to maintain the time average of the voltage across capacitor C1 constant (and instead is periodically charged after a periodic discharge), Nagaraj inherently would not maintain a fixed ratio between the reference voltage of ground and the first amplifier

reference signal. Therefore, Nagaraj fails to anticipate the specific feature of claim 15 of “*where the charge pump includes means for generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.*”

In addition, the present application is a continuation of U.S. Patent Application Serial Number 09/853,882, now issued U.S. Patent 6,617,931. A Terminal Disclaimer has been filed in the present application in light of the claims of the ‘931 patent. During the prosecution of the ‘882 patent application, Nagaraj was cited as anticipatory prior art. However, in the “Reasons for Allowance” in the Detailed Action, dated March 28, 2003, that accompanied the Notice of Allowance in the ‘882 patent application, it was stated that “[c]laims 1-19 are allowed over the prior art because none of the prior art disclosed or suggested showing the particular structure and/or operation recited in these claims, namely ... Claims 8-11 call for, among others, means for generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.” (Detailed Action, pg. 2, emphasis added). Thus, the feature of claim 15 of “*where the charge pump includes means for generating a bias voltage to maintain a fixed ratio between the reference voltage and the first amplifier input signal.*” a feature identical to that of claims 8-11 of the ‘931 patent, has been admitted to be patentable over Nagaraj.

In light of the foregoing, it is respectfully submitted that the anticipation rejection of claim 15 in view of Nagaraj is moot and should be removed, and that claim 15 is in condition for allowance and should be passed to issuance.

Claim 19

As independent claim 19 currently stands rejected in the Official Action for the identical reasons as claim 15, the arguments presented hereinabove with respect to the patentability of claim 15 are applicable to claim 19.

4. The allowance of claims 8-14 is noted and appreciated.

Claims 8-14 have been amended to change "said" to "the".

5. The indication that claims 16-18, 20-22, 25 and 26 contain allowable subject matter and would be allowed if amended to no longer depend from a rejected claim is noted and appreciated.

Claims 16-18, 20-22, 25 and 26 have been amended to correct some minor typographical errors, such as for example changing "said" to "the".

For all the foregoing reasons, reconsideration and allowance of claims 8-26 is respectfully requested.

If a telephone interview could assist in the prosecution of this application, please call the undersigned attorney.

Respectfully submitted,



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